

# **Solving the Woes of Statistical Seismology: The Community Online Resource for Statistical Seismicity Analysis (CORSSA)**

Andrew J. Michael - USGS

Stefan Wiemer - ETH

Karen Felzer - USGS

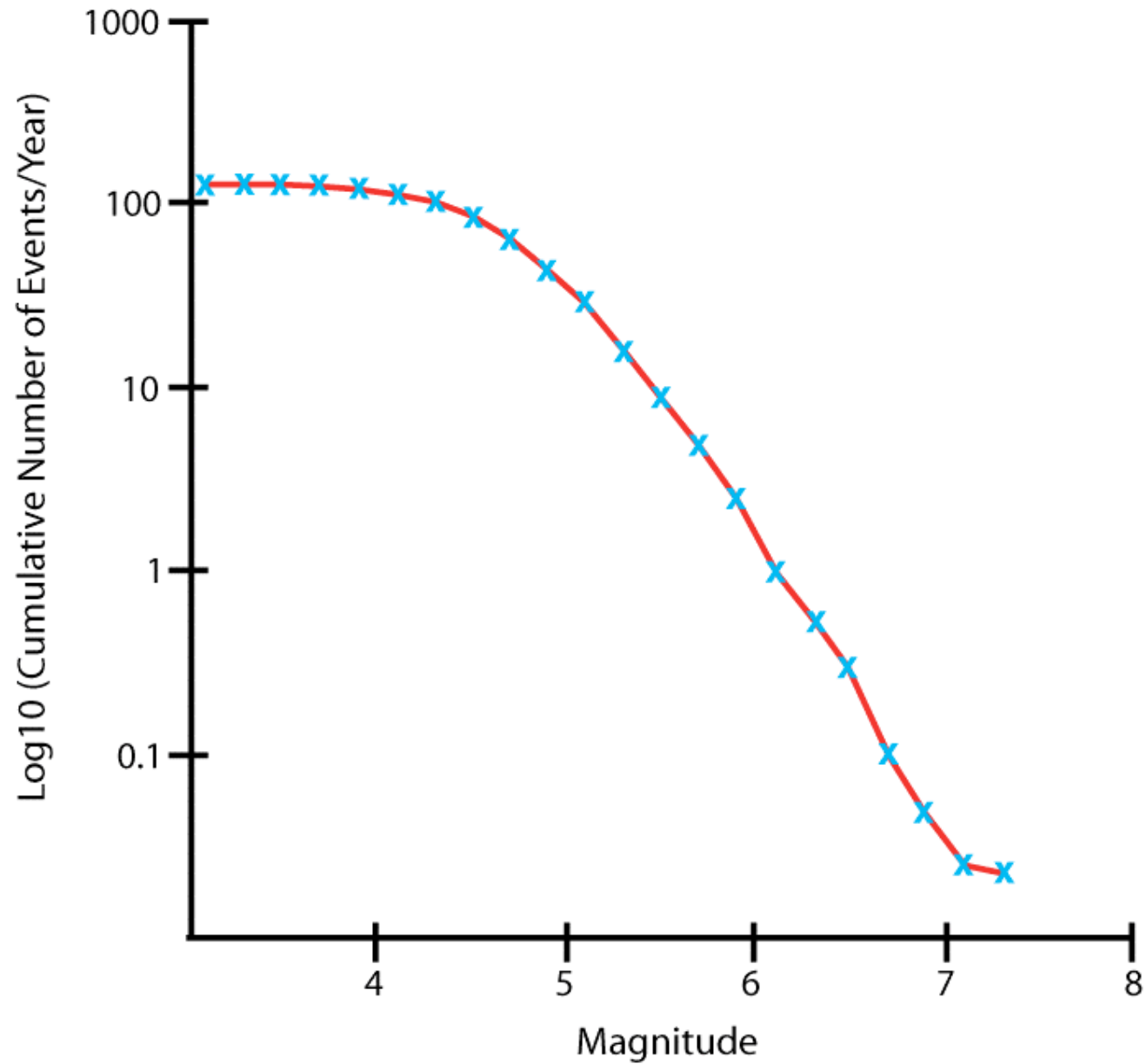
Danijel Schorlemmer - USGS

Jochen Woessner - ETH

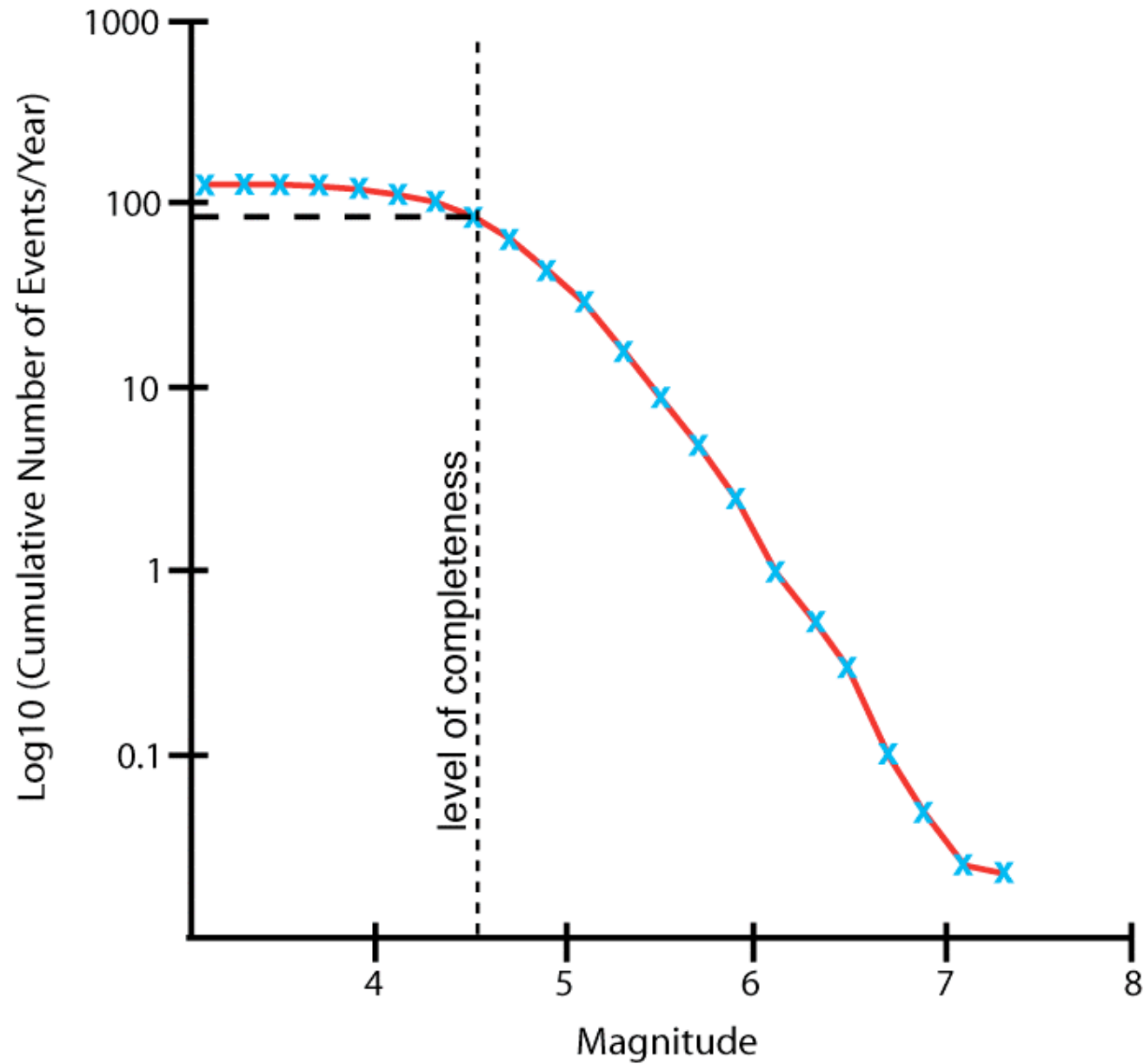
Agnes Helmstetter - Univ. of Grenoble

& You?

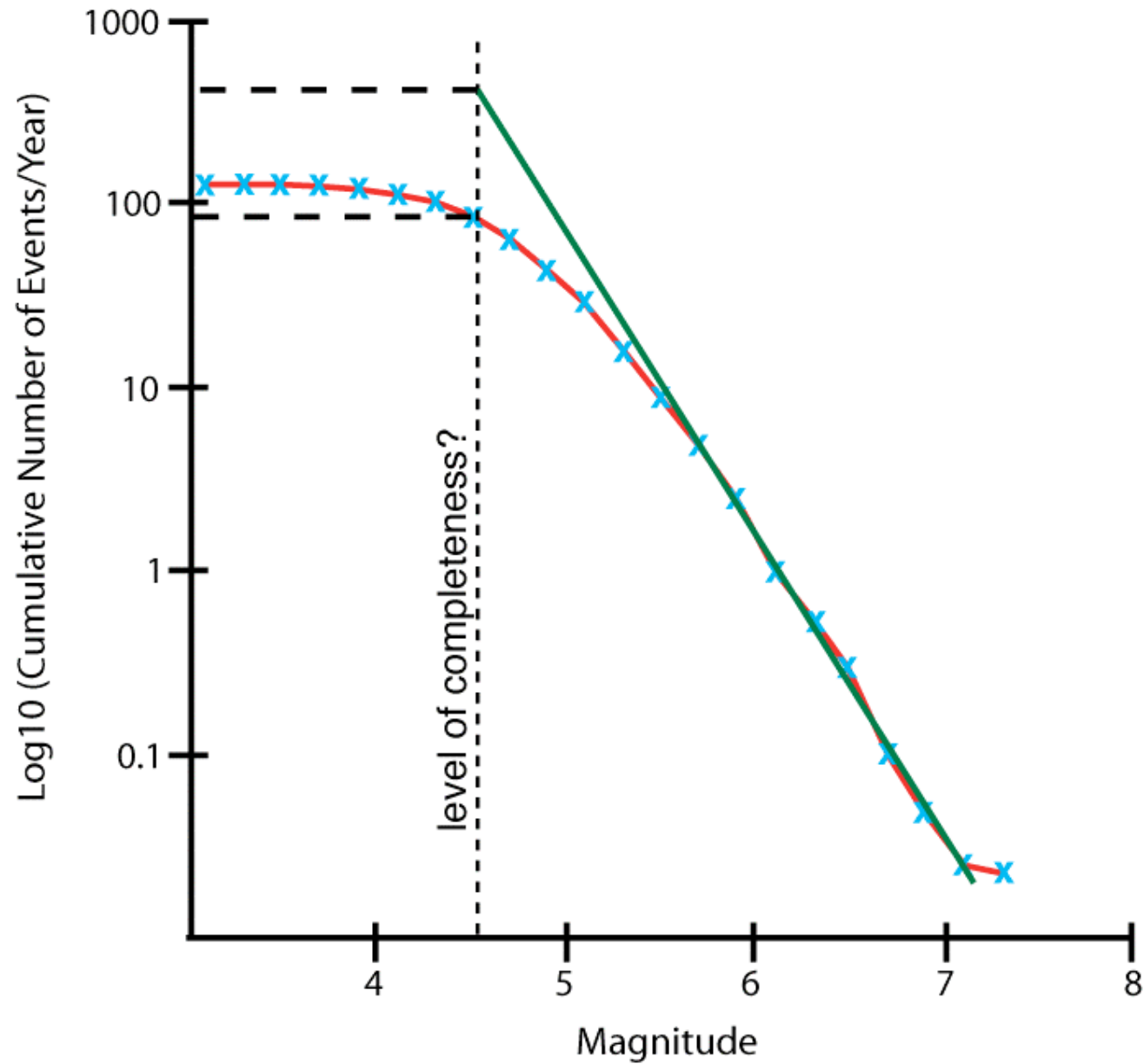
# Determining Completeness Subjectively



# Determining Completeness Subjectively



# Determining Completeness Subjectively



# Phase Of Omega Signals As Received At Omsk For December 28-30, 1983

Professor A.P. REUTOV,  
Academician of Russian  
Academy of Sciences  
Doctor V.F. MARENKO

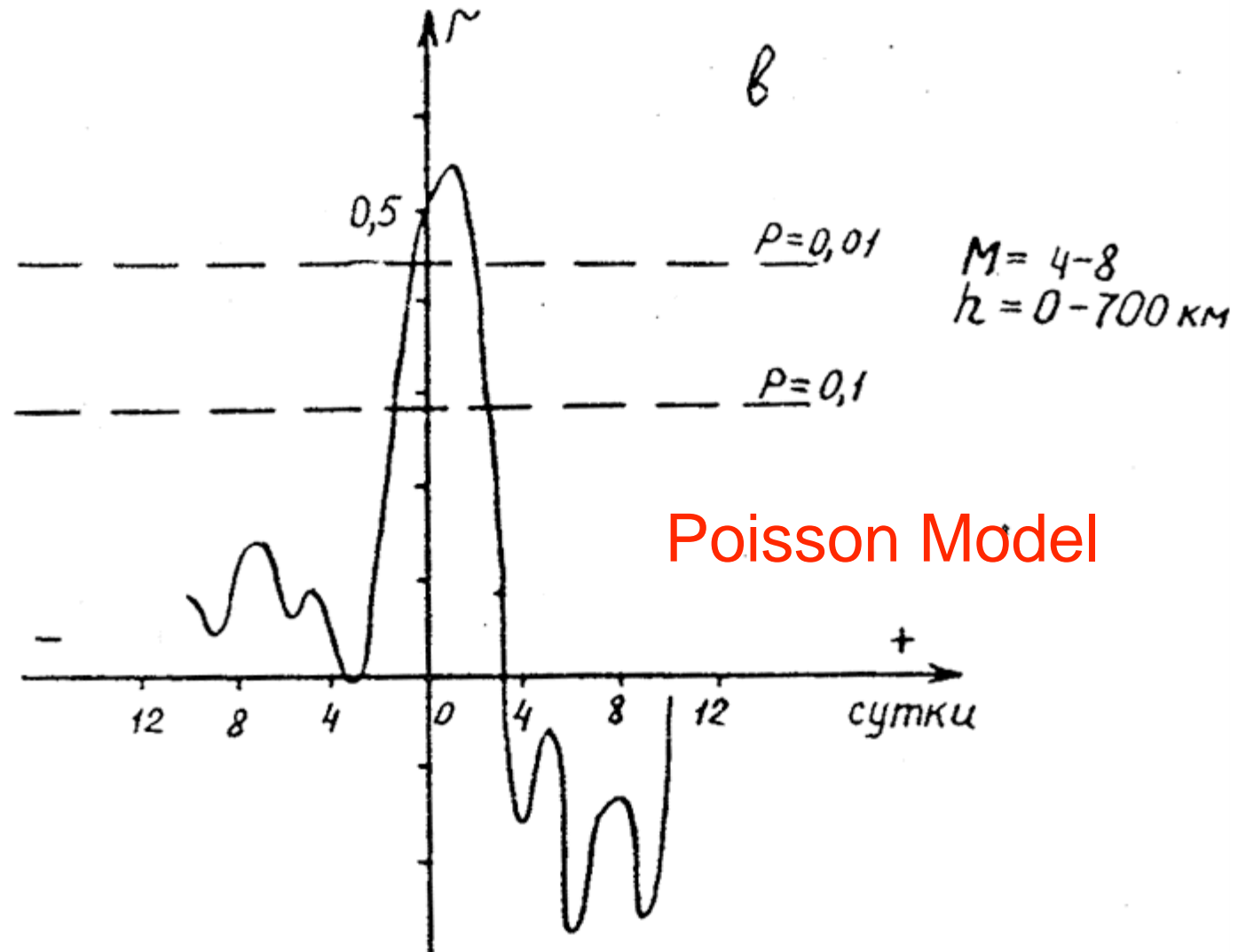
Earthquake in  
Hindu Kush Region

dashed: expected pattern

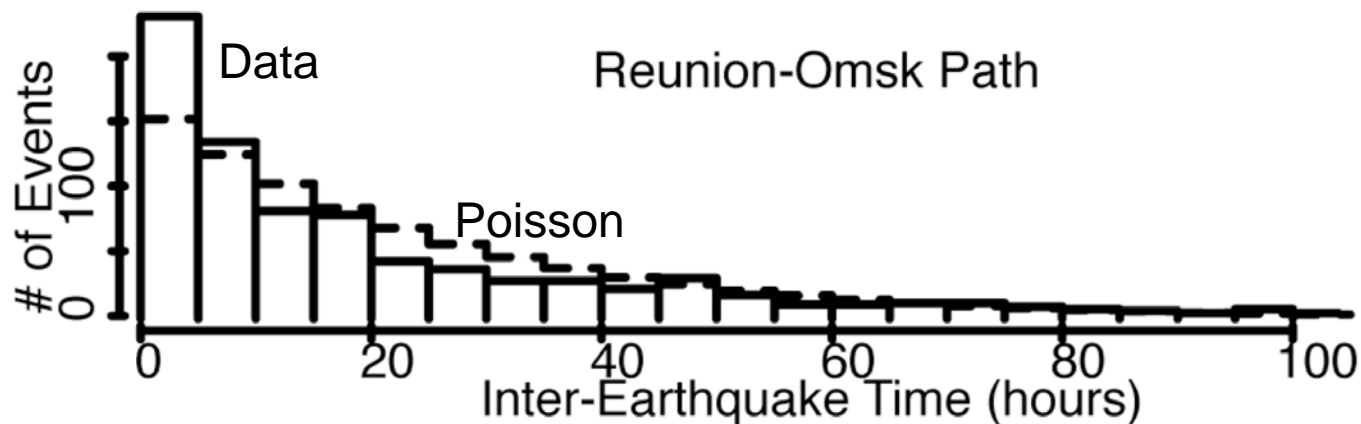
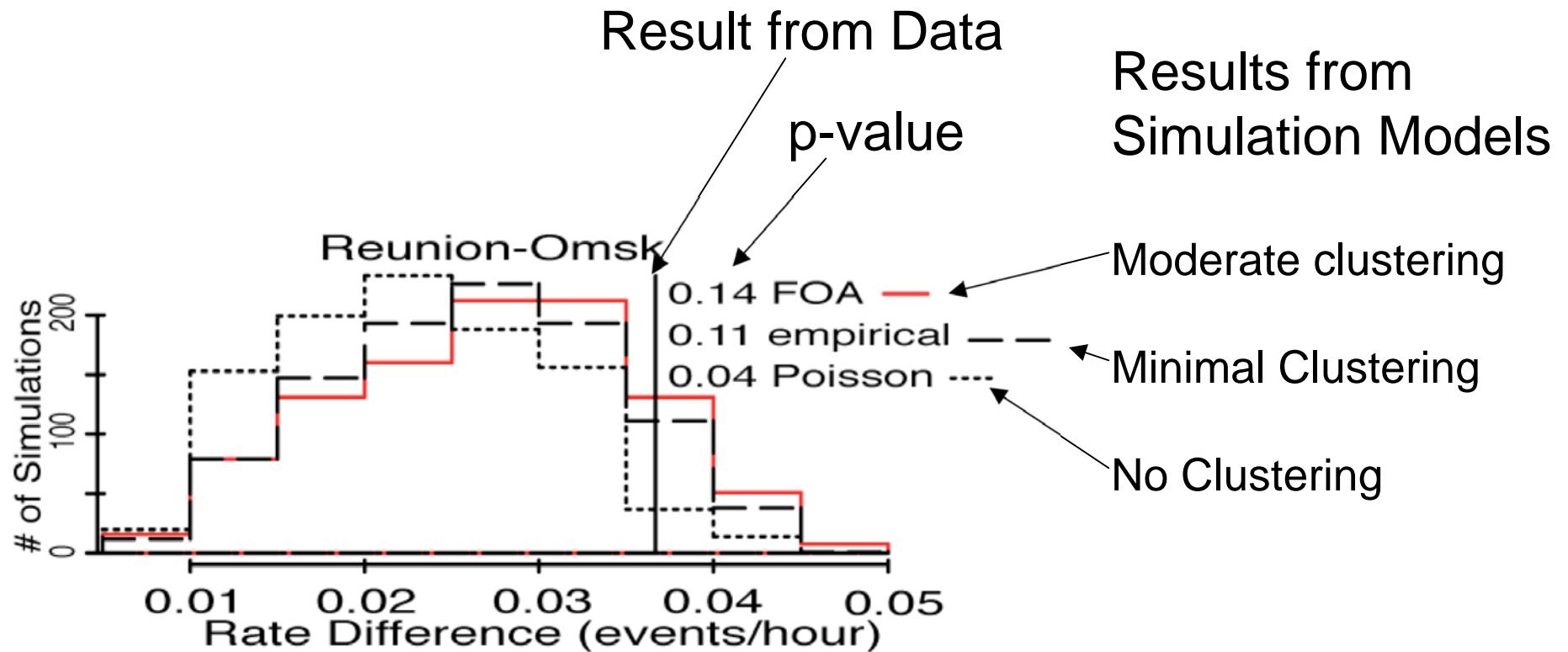
CONC  
of radio wave ear  
system building, e



Moscow



# VLF Prediction Tests from Michael, GRL, 1997



EOS - October 3, 2006, M. Kamogawa

# Preseismic Lithosphere-Atmosphere-Ionosphere Coupling

PAGES 417-424

Preseismic  
sphere and  
near-Earth

frequency electromagnetic variations have  
been since the 1970s reported as occurring

atmospheric-ionospheric anomalies  
before the earthquakes do exist

of ionospheric anomalies, they used critical

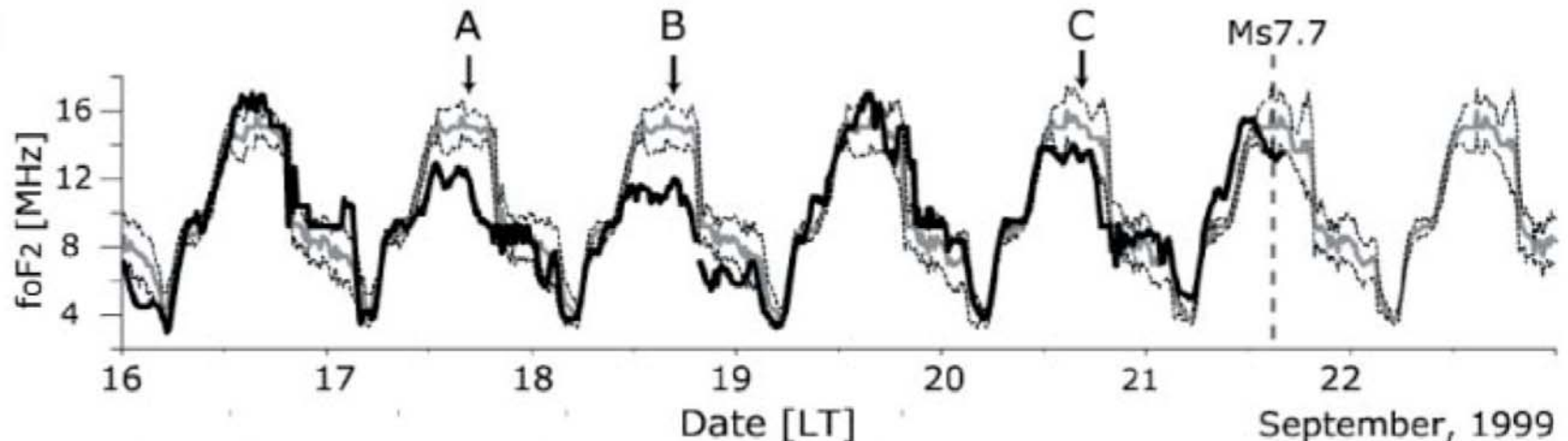
ters in altitude), a region characterized by  
ion compositions and plasma dynamics. The

the statistic  
defined ion  
the Taiwan  
ber) during  
results ind  
within the

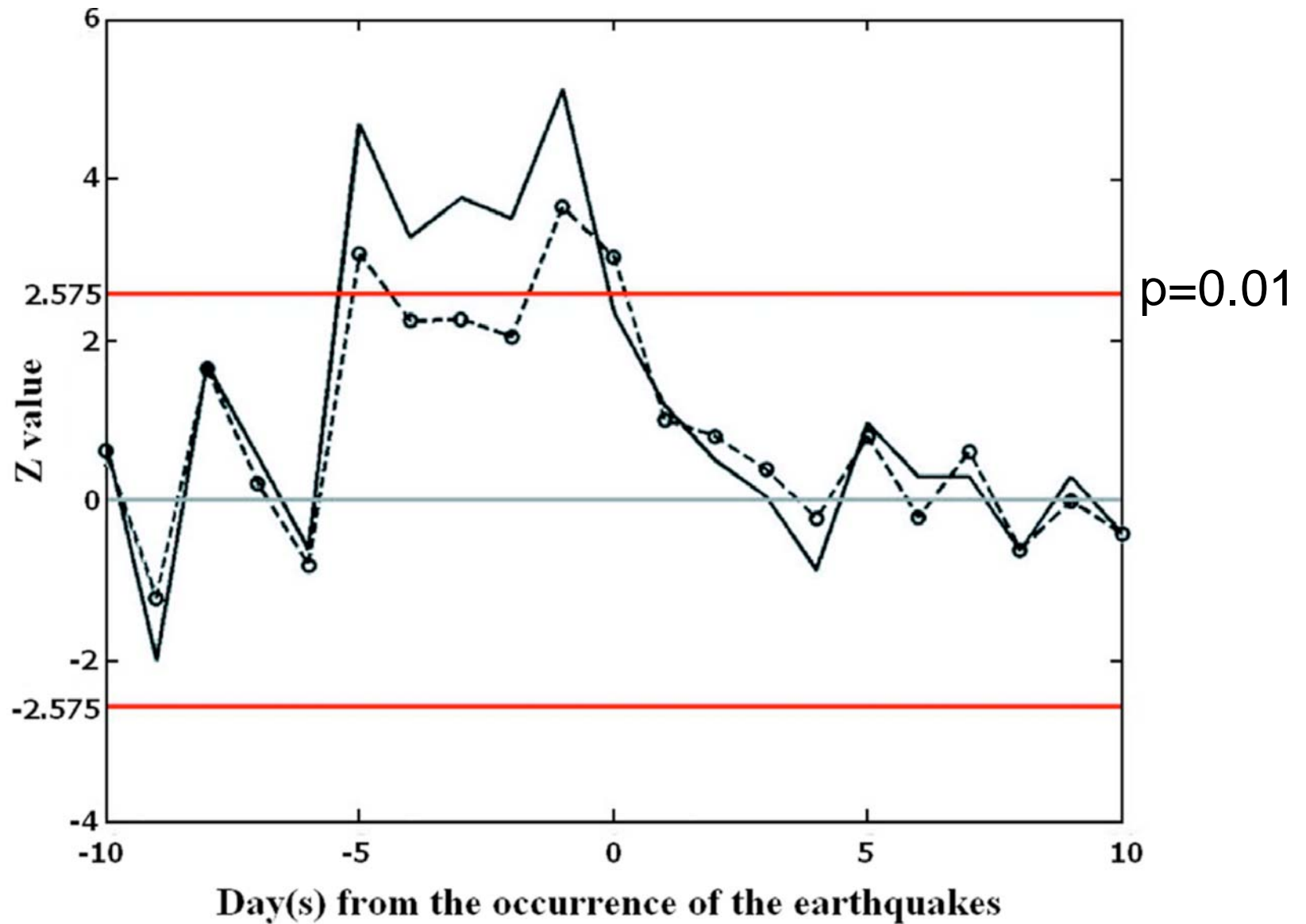
The statisti  
dramatical  
with magn  
picentral  
instrument

Earlier, G  
out the cri

Anomaly before Chi-Chi earthquake after Liu et al., GRL, 2000



From Liu et al., JGRA, 2006







# Existing Resources

Journal

Ogata et al.'s

## Problems:

As good as each piece is,  
the whole is:

Incohesive

Hard to find

Inadequate as a cookbook for beginners

Conference  
Proceedings

Books

# Possible Solutions

Write a book:

a substantial achievement,  
but you have to finish them,  
they are hard to update, and  
expensive.

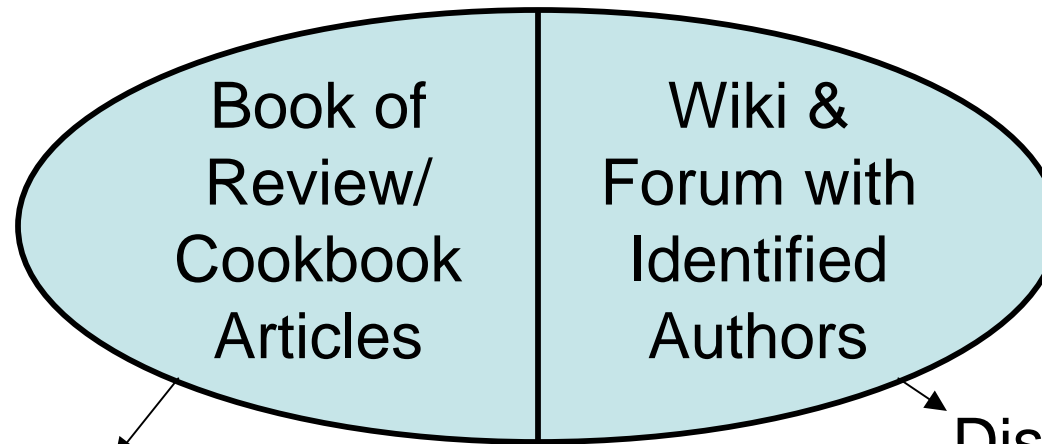
Create a central web site that points to other resources:

easy to do,  
but content will be inconsistent  
and therefore hard to follow.

Write an online book:

but what does that mean,  
is it a Wiki,  
a collection of pdf files,  
or what?

# The Community Online Resource for Statistical Seismicity Analysis (CORSSA)



Substantial articles  
Prepared in LaTeX  
Presented in PDF for  
Viewing online with clickable links,  
Download for printing, and  
Print-on-demand

Discussion of book  
Links to external resources  
Allows for small contributions

# Review/Cookbook Articles

Cover a specific task

Brief, referenced, review of theory

Discuss tradeoffs in analysis choices

Discuss pitfalls

Link to available codes

Give examples of excellent applications

Introduction

How to educate yourself as a statistical seismologist - David Vere-Jones

Fitting Frequency-Magnitude Distributions - Stefan Wiemer

Catalog Completeness - Danijel Schorlemmer, Jochen Woessner

Estimating Seismicity Rates - Andy Michael

Catalog Declustering - Danijel Schorlemmer, Matt Gerstenberger

Catalog Artifacts and Quality Control - Stefan Wiemer

Data Format Standards (QuakeML) - Danijel Schorlemmer

Synthetic Seismicity Catalog Production -

Andy Michael, Agnes Helmstetter, Karen Felzer

Point Processes - David Harte

Fitting ETAS and Omori-Utsu Distributions - Yoshihiko Ogata

# Authoritative

1. Known, expert authors
2. Peer review with an editorial board
3. Editorial board oversight of Wiki and forum
4. Basic science must be previously published in a peer reviewed journal
5. Provide ways to benchmark codes

# Up-to-Date

1. Updated on an annual basis
2. Schedule gives authors deadlines
3. Schedule provides time for peer review

# Prominent

1. Articles in *Eos* and SRL
2. Presentations at meetings
3. Provide clear guidelines for citing CORSSA



# User-Friendly

1. Encourage use of data format standards.
2. Encourage development of portable codes.
3. Encourage development of stand-alone codes rather than using Matlab or other commercial packages.

# **The Key Word in CORSSA Is Community**

CORSSA's goal is to improve the quality of research that applies the methods of statistical seismology.

This will benefit the community but requires that you join us  
to suggest articles,  
to write articles, or  
to contribute to the Wiki.

Please join us.